Incidence of fatigue symptoms and diagnoses presenting in UK primary care from 1990 to 2001

Arlene M Gallagher MSc[1] Janice M Thomas MSc[1] William T Hamilton FRCGP[2] Peter D White MD[1]

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SUMMARY

Little is known about whether the incidence of symptoms of fatigue presented in primary care, and the consequent diagnoses made, change over time. The UK General Practice Research Database was used to investigate the annual incidence of both fatigue symptoms and diagnoses recorded in UK primary care from 1990 to 2001.

The overall incidence of all fatigue diagnoses decreased from 87 per 100 000 patients in 1990 to 49 in 2001, a reduction of 44%, while postviral fatigue syndromes decreased from 81% of all fatigue diagnoses in 1990 to 60% in 2001. Chronic fatigue syndrome (CFS) and myalgic encephalomyelitis (ME) together increased from 9% to 26% of all fatigue diagnoses. The incidence of fibromyalgia increased from less than 1 per 100 000 to 35 per 100 000. In contrast, there was no consistent change in the incidence of all recorded symptoms of fatigue, with an average of 1503 per 100 000, equivalent to 1.5% per year. CFS/ME and fibromyalgia were rarely diagnosed in children and were uncommon in the elderly. All symptoms and diagnoses were more common in females than in males.

The overall incidence of fatigue diagnoses in general has fallen, but the incidence rates of the specific diagnoses of CFS/ME and fibromyalgia have risen, against a background of little change in symptom reporting. This is likely to reflect fashions in diagnostic labelling rather than true changes in incidence.

INTRODUCTION

Medicine is the victim of fashion like any other human endeavour, and the naming of diseases is not exempt. For unexplained fatigue, the diagnostic labels include post-infectious or postviral fatigue syndromes (PVFS), chronic fatigue syndrome (CFS), myalgic encephalomyelitis/encephalopathy (ME), and neurasthenia.[1] The term neurasthenia was coined in 1869,[2] ME in 1956[3] and CFS in 1988.[4]

The particular label given to a condition reflects both the patient's and the doctor's views about the condition, which may then influence treatments offered and outcome.[5] Some doctors do not use the term ME. Equally, some patients dislike the term CFS. These different diagnostic labels may have arisen because of widely varying theories about the underlying pathology. Different labels for similar conditions may simply reflect medical specialization.[6] Fibromyalgia is sometimes included in the spectrum of fatigue syndromes.[6,7] Patients with fibromyalgia frequently complain of chronic fatigue, and a patient may meet criteria for both fibromyalgia and CFS.[7]

Studies of the incidence of fatigue symptoms presenting in primary care have generally examined small localities. In Ireland and Holland annual incidences of reporting to primary care doctors were 6.5 and 5.3 per 100 patients, respectively.[8,9] An international figure of 6.3 reports has also been calculated.[10] Higher figures are obtained if primary care attenders are questioned specifically on fatigue.[11] A Scottish study of the diagnosis of CFS in a single general practice estimated the incidence to be 0.37%, but this was based on only 2 patients.[12] The biggest population survey originates from the USA with an incidence of 0.18%.[13] There have been no reported studies of the incidence of fatigue diagnoses over time. We therefore looked at a large UK primary care population over 12 years, examining the incidence of fatigue complaints and diagnoses, including fibromyalgia.

METHODS

The study population consisted of all patients registered with a general practitioner contributing to the General Practice Research Database (GPRD) in the UK. Doctors recorded full details of patient characteristics, including all consultations, on their practice computers. Data are subject to thorough validation and stringent quality checks.

[1]Centre for Psychiatry and Department of Information Services, Queen Mary School of Medicine and Dentistry, St Bartholomew's Hospital, London EC1A 7BE; [2]Division of Primary Health Care, University of Bristol, Bristol BS6 6JL, UK

Correspondence to: Professor P D White, Department of Psychological Medicine, Barts and the London, Queen Mary's School of Medicine and Dentistry, St Bartholomew's Hospital, London EC1A 7BE, UK

E-mail: p.d.white@qmul.ac.uk

Electronic records in the GPRD are regarded as high quality and the database has been used in many research studies. For coding, doctors used either the Oxford medical information system (Oxmis) or Read.[14] Oxmis coding was the main system initially but has been progressively replaced by Read.

Identification of symptoms and diagnoses

Lists of 44 symptoms and 28 diagnoses were identified by consensus from the library of codes [Table A: available from the authors]. The Oxmis system has no code for CFS; however, all diagnostic codes were available in Read. The symptom codes were collated into one group. The diagnostic codes were collated into five groups—CFS/ME, PVFS, fibromyalgia, asthenias, and debilities [Table A]. Since the last two groups were small they were combined for analysis. Symptoms were considered incident if there had been no other fatigue symptom or diagnosis recorded in the previous year, which allowed patients to present more than once in the sampling period with incident fatigue, since fatigue is known to be sometimes recurrent. Because fatigue diagnoses such as PVFS can occur more than once in a lifetime, diagnoses were considered incident if there had been no other fatigue diagnosis in the previous year, although symptoms were allowed during the previous year.

Data extraction and analysis

We extracted details of age, sex and all relevant codes, together with their recorded dates. For 7 patients who had more than one code on the same day the first code was used. The incidence rate was expressed per 100 000 individuals, taking into account the changing denominator. The rate was calculated as the number of patients with an incident diagnosis or symptom per year, divided by the denominator population in the GPRD on 1 June that year. This was because the GPRD population of patients varied by year (Figure 1 [Table B from the authors]). On initial analysis, results from 1988 and 1989 were low for both symptoms and diagnoses. These years coincided with the beginning of the GPRD collection period when doctors were becoming familiar with the database. It is likely that fatigue symptoms and diagnoses were not coded as reliably as they were later. For these reasons data from these two years are not shown in the main results [Table B].

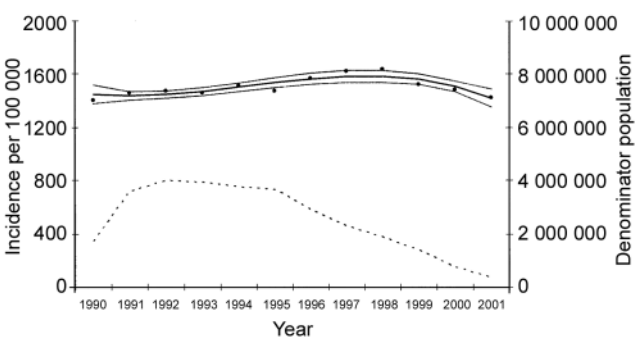

Figure 1 **Incidence of all fatigue symptoms.** • Symptoms; — fitted line; — 95% confidence interval; - - - population denominator

The significance of any change over time was tested by standard 2×2 contingency table methods on 1990 and 2001 data. Polynomial regression was also used to assess the relation across time for all fatigue symptoms and diagnoses (excluding fibromyalgia). Data are presented together with 95% confidence intervals. Age-specific incidence was calculated as a 5-year moving average. Differences between patient characteristics in the four diagnostic groups were assessed by one-way analysis of variance or contingency table analyses where appropriate. Statistical analyses were performed by use of STATA, release 7.0. Our study was approved by the Scientific and Ethical Advisory Group of the GPRD.

RESULTS

The population denominator in the GPRD is shown in Figure 1. The mean population was 2.4 million, range 380 428–4 012 181 patients. The mean age of those sampled in each year was between 39 and 42 years throughout the period of study. Over the study period 463 348 fatigue symptoms were recorded in 399 817 patients and 21 389 fatigue diagnoses were recorded in 20 079 patients. A further 1358 fibromyalgia codes in 1092 patients were recorded. Overall, 972 (4.3%) of all the incident diagnoses were second or subsequent diagnoses, with a mean of 3 (SD 1.9) years between first and second diagnoses (Table 1).

Symptoms

The incidence of all fatigue symptoms recorded is shown in Figure 1. In 1990 the incidence was 1404 per 100 000 patients; in 2001 it was 1425—not a significant change (χ^2=0.96, df=1, P=0.33). However, the overall pattern of change was shown to be cubic (R^2=71%) (Figure 1). The mean annual incidence for the whole period was 1503 per 100 000, equivalent to 1.5% per year. The mean age at presentation was 47 (SD 22.4) years and 71% were female (female/male ratio 5/2). The incidence of fatigue symptoms was lowest in children (below 500 per 100 000) in ages 0–14 years, rising to the adult rate by age 18 years.

Diagnoses

Figure 2 shows the incidence for all recorded fatigue diagnoses. It fell from 87 per 100 000 patients in 1990 to 49 per 100 000 patients in 2001, a reduction of 44% (χ^2=57.91, df=1, $P<0.001$). The regression equation was linear, showing a reduction of 3.5 per 100 000 patients per

Table 1 **First and second incidence of fatigue diagnoses, including fibromyalgia**

Group	*Incident diagnoses*	*2nd incidences within same group*	*Percentage of all incident diagnoses*	*Mean (SD) years from 1st to 2nd incidence*
CFS/ME	2118	226	10.7	3 (1.9)
PVFS	12 821	466	3.6	3 (1.8)
Debility/asthenia	6450	77	1.2	2 (1.7)
Fibromyalgia	1358	203	14.9	4 (2.2)
Total	22 747	972	4.3	3 (1.9)

CFS/ME=chronic fatigue syndrome/myalgic encephalomyelitis; PVFS=postviral fatigue syndrome; SD=standard deviation

year (R^2=86%) (Figure 2). The mean age at presentation was 41 (SD 18.2) years and 66% were female, female/male ratio 2/1.

Figure 3 divides the total incidence recorded into the three diagnostic groups and also shows fibromyalgia diagnoses. The percentage of PVFS diagnoses decreased from 81% of all fatigue diagnoses (excluding fibromyalgia) made in 1990 to 60% in 2001. The percentage of CFS/ME diagnoses increased from 9% to 26% over the same period. The incidence of fibromyalgia diagnoses also increased from less than 1 per 100 000 to 35 per 100 000. CFS (a Read code) became available as a diagnosis from around 1995 when the gradual transfer from Oxmis to Read coding began. The choice between CFS and ME was examined with Read code data alone from 1995. The proportion of diagnoses of CFS out of CFS/ME combined rose from 14% in 1995 to 71% in 2001.

The age-specific incidence for each diagnostic group recorded is shown as a 5-year moving average in Figure 4. CFS/ME and fibromyalgia were rarely diagnosed in children and were uncommonly diagnosed in the elderly. In contrast, both PVFS and debility/asthenia were diagnosed across all ages.

A somewhat greater proportion of females were diagnosed with CFS/ME than with PVFS. For both, mean age at diagnosis was 39 years. Patients with a diagnosis of fibromyalgia were the oldest and had the highest female/male ratio (Table 2).

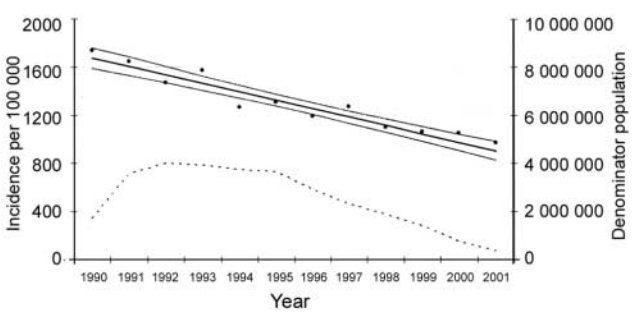

Figure 2 **Incidence of all fatigue diagnoses, excluding fibromyalgia** [Symbols as in Figure 1]

DISCUSSION

In 12 years the incidence of all recorded fatigue diagnoses almost halved, whereas the incidence of recorded fatigue symptoms changed little. Specific diagnoses used by general practitioners changed considerably, with an increase in CFS/ME and fibromyalgia and a reduction in PVFS. CFS/ME and fibromyalgia were rarely diagnosed in children and were uncommonly diagnosed in the elderly. All symptoms and diagnoses were more commonly recorded in females.

Certain limitations of the study must be acknowledged. We defined diagnostic incidence as a new record following a year free of any fatigue diagnosis. This definition might include recurrences or relapses or persistent ill-health unreported to the doctor—a concern in chronic conditions such as CFS/ME. However, second 'incident' reports comprised only 4.2% of cases, so any effect from this was small.

Diagnoses were made clinically and were not independently confirmed. General practitioners were unlikely to have used established criteria in diagnosing CFS, ME or fibromyalgia.[15,16] However, since there are no specific tests for these diagnoses, independent verification might not have improved diagnostic validity. The established quality of information recorded in the GPRD suggests that these figures accurately represent fatigue presenting to UK primary care.

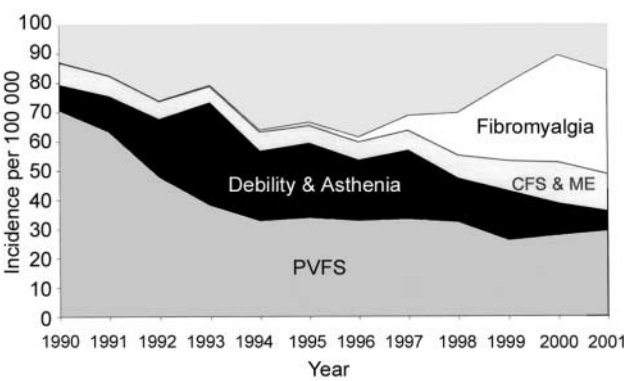

Figure 3 **Breakdown of fatigue diagnosis by group** [Abbreviations as in Table 1]

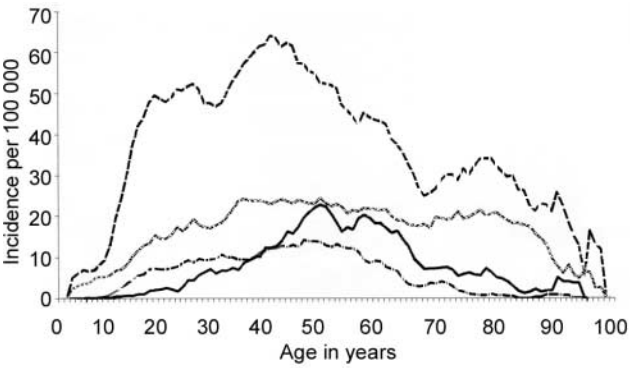

Figure 4 **Age-specific incidence (5-year moving average).** [— — — Postviral fatigue syndrome; ····· debility/asthenia; – · – fibromyalgia; —— chronic fatigue syndrome/myalgic encephalomyelitis

This study was designed to investigate changes in diagnostic labelling as well as to obtain overall incidence rates of fatigue presenting in primary care. Therefore, the data should not be interpreted as the community incidence of fatigue, since some patients with fatigue do not report to their doctor. We can however generalize our results to UK primary care as a whole since the GPRD is representative of this population. The study is much larger than any previous one in terms of the number of patients with fatigue syndromes, as reflected by the narrow confidence intervals throughout.

Our overall incidence of 1.5% for the symptom of fatigue was lower than the 5.3–6.5% reported in other primary care studies.[8,9] This discrepancy may in part relate to our including children and the elderly, which previous surveys did not. Our more comprehensive sampling will have reduced the overall incidence of fatigue since this symptom is seldom reported at the extremes of age. For fatigue diagnoses, our incidence rates of between 87 and 49 cases per 100 000 were much lower than the estimated of 370 per 100 000 in the single-practice Scottish study and half that of the large but local population survey in the USA.[12,13] Self-reported fatigue in population studies may have a greater frequency and lesser severity than fatigue brought by a patient to medical attention. Furthermore, interview studies may be subject to recall bias, whereas in this study reports were made contemporaneously.

Table 2 **Mean age and sex ratios by diagnostic group**

Group	*Mean age (SD)*	*Sex-specific incidence per 100 000: F,M*	*Female/ male ratio*
CFS/ME	39 (13.8)	10, 4	5/2
PVFS	39 (18.0)	52, 29	2/1
Debility/ asthenia	44 (19.5)	22, 13	2/1
Fibromyalgia	48 (13.7)	14, 3	4/1

Abbreviations as in Table 1

As others have found, fatigue symptoms and diagnoses were most commonly recorded in young and middle-aged women.[1] Our results also confirm the link between female sex and fibromyalgia,[16] but suggest an older age of onset for fibromyalgia than for CFS/ME. CFS and ME were seldom recorded before puberty. This could reflect a reluctance by doctors to diagnose these conditions in children; alternatively, they may simply be rare in this age group, as other surveys suggest.[17] Our finding that the symptom of fatigue was likewise uncommon in children supports the latter interpretation.

The most remarkable finding was the 44% reduction in all fatigue diagnoses recorded over 12 years. Why did this occur? Since the incidence of fatigue as a reported symptom did not decline over the same period, the decline in diagnoses is probably due to changes in doctors' choice of label. The overall decline was caused by a 59% fall in the incidence of PVFS, which overwhelmed the smaller increase in CFS/ME. There is no obvious explanation for the decline in PVFS diagnoses other than a partial replacement by CFS/ME. The rise in CFS/ME, especially notable since 1997, may have been due to increased legitimization and awareness of CFS since the UK Royal Colleges' report of 1996.[18] This interpretation is consistent with the increase in the incidence of diagnoses of CFS relative to ME since 1995.

The remarkable growth in the diagnosis of fibromyalgia through the late 1990s was due either to diagnostic fashion or to a true increase in incidence. In our view, an actual increase in incidence is unlikely. The rise more probably represents a current fashion for fibromyalgia, replacing previous diagnoses such as muscular rheumatism and fibrositis.[19] Fibromyalgia is now a more common diagnosis in primary care than CFS/ME combined.[20] Indeed, in Figure 3 it appears that the increase in fibromyalgia has simply replaced the decrease in PVFS. However, we do not think that fibromyalgia is 'the new ME' or that it has replaced PVFS, since the incidence of recorded CFS/ME is still growing and the decline in PVFS preceded the growth of fibromyalgia. Furthermore, patients diagnosed with fibromyalgia were on average older and were more likely to be female than patients with CFS/ME and PVFS.

Chronic fatigue is one of a diverse group of physical symptoms that have long defied satisfactory explanation by doctors.[6] Over the past 150 years it has been diagnosed in different ways according to the prevailing medical fashion.[2–4,6,21] For many patients and doctors, fatigue is attributed either to a known medical illness, such as diabetes mellitus, or to life problems, such as child-care, overworking, or 'stress'.[22] Some specialists suggest that labelling of unexplained chronic fatigue as CFS, ME, or

fibromyalgia is not in the patients' interests.[5,21] Hadler, for example, argues that such labels may even delay recovery, because of implicit messages of chronicity and debility without cure.[21] Beliefs about an illness can determine both disability and outcome.[5,23] In contrast, other specialists argue that such a diagnostic label may help legitimize suffering, and provide meaning for the patient.[5,24,25] It may also strengthen the doctor–patient relationship, since labelling with a specific diagnosis demonstrates that the doctor agrees the problem is both genuine and important.[26] Further research should explore the disabling and enabling influences of diagnostic labelling on prognosis.[5,24]

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REFERENCES

1 Wessely S, Hotopf M,Sharpe M. *Chronic Fatigue and its Syndromes*. Oxford: Oxford University Press, 1998

2 Beard G. Neurasthenia, or nervous exhaustion. *Boston Med Surg J* 1869;**3**:217–21

3 Anonymous. A new clinical entity? *Lancet* 1956;**i**:789–90

4 Holmes G, Kaplan J, Gantz N. Chronic fatigue syndrome: a working case definition. *Ann Intern Med* 1988;**108**:387–9

5 Page L, Wessely S. Medically unexplained symptoms: exacerbating factors in the doctor–patient encounter. *J R Soc Med* 2003;**96**:223–7

6 Wessely S, Nimnuan C, Sharpe M. Functional somatic syndromes: one or many? *Lancet* 1999;**354**:936–9

7 Aaron LA, Buchwald D. A review of the evidence for overlap among unexplained clinical conditions. *Ann Intern Med* 2001;**134**:868–81

8 Cullen W, Kearney Y, Bury G. Prevalence of fatigue in general practice. *Ir J Med Sci* 2002;**171**:10–12

9 Kenter E, Okkes I, Oskam S, Lamberts H. Tiredness in Dutch family practice. Data on patients complaining of and/or diagnosed with 'tiredness'. *Fam Practice* 2003;**20**:434–40

10 Skapinakis P, Lewis G, Mavreas V. Cross-cultural differences in the epidemiology of unexplained fatigue syndromes in primary care. *Br J Psychiatry* 2003;**182**:205–9

11 Wessely S, Chalder T, Hirsch S, Wallace P, Wright D. The prevalence and morbidity of chronic fatigue and chronic fatigue syndrome: a prospective primary care study. *Am J Pub Health* 1997;**87**:1449–55

12 Lawrie S, Manders D, Geddes J, Pelosi A. A population-based incidence study of chronic fatigue. *Psychol Med* 1997;**27**:343–53

13 Reyes M, Nisenbaum R, Hoaglin D, *et al*. Prevalence and incidence of chronic fatigue syndrome in Wichita, Kansas. *Arch Intern Med* 2003;**163**:1530–6

14 de Lusignan S, Minmagh C, Kennedy J, Zeimet M, Bommezijn H, Bryant J. A survey to identify the clinical coding and classification systems currently in use across Europe. *Medinfo* 2001;**10**(Pt 1):86–9

15 Fukuda K, Straus E, Hickie I, Sharpe M, Dobbins J, Komaroff A. The chronic fatigue syndrome: a comprehensive approach to its definition and study. *Ann Intern Med* 1994;**121**:953–9

16 Wolfe F, Smythe H, Yunus M, *et al*. The American College of Rheumatology 1990 Criteria for the Classification of Fibromyalgia. Report of the multicenter criteria committee. *Arthritis Rheum* 1990;**33**:160–72

17 Chalder T, Goodman R, Wessely S, Hotopf M, Meltzer H. Epidemiology of chronic fatigue syndrome and self-reported myalgic encephalomyelitis in 5–15 year olds: cross sectional study. *BMJ* 2003;**327**: 654–5

18 *Chronic Fatigue Syndrome: Report of a Joint Working Group of the Royal College of Physicians, Psychiatrists and General Practitioners*. London: RCP, 1996

19 Quintner J, Cohen M. Fibromyalgia falls foul of a fallacy. *Lancet* 1999;**353**:1092–4

20 Bazelmans E, Vercoulen JH, Swanink CM, *et al*. Chronic fatigue syndrome and primary fibromyalgia syndrome as recognized by GPs. *Fam Practice* 1999;**16**:602–4

21 Hadler N. Fibromyalgia, chronic fatigue, and other iatrogenic diagnostic algorithms. *Postgrad Med* 1997;**102**:161–7

22 David A, Pelosi A, McDonald E, Stephens D, Ledger D, Rathbone R. Tired, weak, or in need of rest: fatigue among general practice attenders. *BMJ* 1990;**301**:1199–202

23 Smith S, Sullivan K. Examining the influence of biological and psychological factors on cognitive performance in chronic fatigue syndrome; a randomized, double-blind, placebo-controlled, crossover study. *Int J Behav Med* 2003;**10**:162–73

24 Woodward R, Broom D, Legge D. Diagnosis in chronic illness: disabling or enabling—the case of chronic fatigue syndrome. *J R Soc Med* 1995;**88**:325–9

25 Working Group. *A Report of the CFS/ME Working Group*. London: Department of Health, 2002

26 Deale A, Wessely S. Patients' perceptions of medical care in chronic fatigue syndrome. *Soc Sci Med* 1952;**52**:1859–64